SURVEY ON AQUATIC WASTE MANAGEMENT SYSTEM

[1]Vijith C, [2]Vishnu K B, [3]V S Sreehari, [4]Nivea Rose
[1]Faculity, [2]student, [3]student, [4] student
[1]Sahrdaya College of Engineering and Technology, Kodakara, Kerala

Abstract— At present there are a few methods already present for the purification of aquatic environment. But most of it is limited to micro-purification, chlorination and oxygenation of the water life. Most of the methods used to remove macroscopic waste are manual or machines / devices which are manually operated. A few methods for navigation and waste removal are currently available. The macroscopic waste present in the water bodies are currently creating a high mode of threat to the use of this water for the people living in the corresponding areas. Abundant dumping of waste in to the water could affect the aquatic life in a threatening way. Non organic waste present in it can result in blockage of water flow and the decaying of organic waste could result in catastrophic destruction of aquatic life in that area due to difference in oxygen, COD and BOD level rise or depletion. This problem can be avoided by using a fully automated system to monitor and remove all those waste from the water bodies.

Keywords: COD, BOD

I. INTRODUCTION

Clean water is vital to our health, communities, and economy. Our communities are impacted by water contamination .People depend on clean water for their health. Our cherished way of life depends on clean water: healthy ecosystems provide wildlife habitat and places to fish, paddle, surf, and swim. The economy we strive on depends on clean water: manufacturing, farming, tourism, recreation, energy production and other economic sectors need clean water to function and flourish. It is so important that we want clean water. Water is our most precious resource. Water is vital to life. Humans, plants, and animals are made up of mostly water. All living things would die if it weren't for water. We use water for drinking, washing, cleaning, cooking, and growing our food as well as many, many other things. Even more water is used by industries to generate electricity, manufacture things, and transport people and goods.

In many areas the water contamination is a risk which is being ignored or the necessary steps for the treatment of these effects are not taken. This has resulted in a various number of water borne diseases and anomalies to aquatic and human lives who are dependent on these aquatic life. This is due to the intense amount of work to be done to cleanse the aquatic life is much more than the output which is obtained even after the cleansing of the water body. The next threat faced is that even after the treatment of a system the dumbing of waste will not be stopped in the near future. Thus resulting in the never ending contamination of the aquatic system.

Apart from the negligence one of the other reasons is that most of the cleansing of the aquatic life is done by the manual labour or manually operated machines thus the chances for error due to the negligence of the user could be high. The increase in water borne diseases thus should be considered as a threat and should take necessary steps to prevent it from increasing. Recent surveys show that the dumbed waste in water bodies has resulted in integrating the diseases to a level of 60% increment. So we need to be focussed on bringing down the contamination rate by introducing new and automated systems to do the work.

II. AQUATIC MULTI-ROBOT SYSTEM FOR LAKE CLEANING

The state of the lakes and lakes in dominant part of the creating nations are appalling. A considerable measure of cash and endeavors are being spent by the administration and private firms on cleaning and keeping up them at consistent interims [1, 2]. This work goes for building up a multi-robot arrangement of independent oceanic vehicles, which can perform different assignments required for the cleaning and upkeep of lakes, lakes and fisheries alongside performing auxiliary capacities, for example, controlled sustenance conveyance and angling. A couple of oceanic robots have been fabricated before with the end goal of surface cleaning [3, 4]. These works, be that as it may, are constrained to a couple capacities just and taking into account a solitary robot framework. A couple works are accessible in the open writing, which have talked about the advancement of such exceptional reason robot. This work goes for building up a more adaptable and effective framework by the use of various robots. Exercises like expelling green growth, leaves and twigs, showering of chemicals at the fitting areas, pumping oxygen at whatever point required, checking the water quality and in addition sending payload are wanted to be done self-rulingly. This may spare a great deal of human exertion and give an economical answer for the inescapable issue. With the end goal of route and waste cleaning on the ground, some all around outlined calculations have been produced before for both single automated frameworks and in addition for swarms. Be that as it may, in light of the distinction in the dynamic environment, impetus framework, and the trouble to precisely decide the present position taking into account relative speed and increasing speed, these calculations can't be straightforwardly utilized on amphibian surfaces. Likewise, the route calculations grew before for self-sufficient amphibian robots have not been composed with cleaning as an essential piece of them. In this way, there is a requirement for building up another calculation for the route of these robots and upgrading the exertion in waste expulsion. This paper addresses the issue and displays a reasonable arrangement

III. SYSTEM DESIGN

The four essential issues for outlining the amphibian robots are: cost effective arrangement alongside robustness, adequacy and toughness. Because of the way of the cleaning work, the vehicle structure is outlined to such an extent that it can give high steadiness, incredible mobility and can undoubtedly gather all the waste streaming in the middle. A boat moulded body works best for this case and satisfies all the hydrostatic, sea-keeping and basic solidness criteria. With the end goal of expulsion and gathering of surface waste, an engine driven track-belt framework has been outlined that can gather the squanders in an area secured with a net. This configuration gives a basic and successful waste expulsion and suits a lot of waste inside a little space. In addition, as the gathered waste buoys on the water surface, the robot does not have to bolster its weight. The lower area of the belt is set beneath the water level to effectively take out the skimming weeds

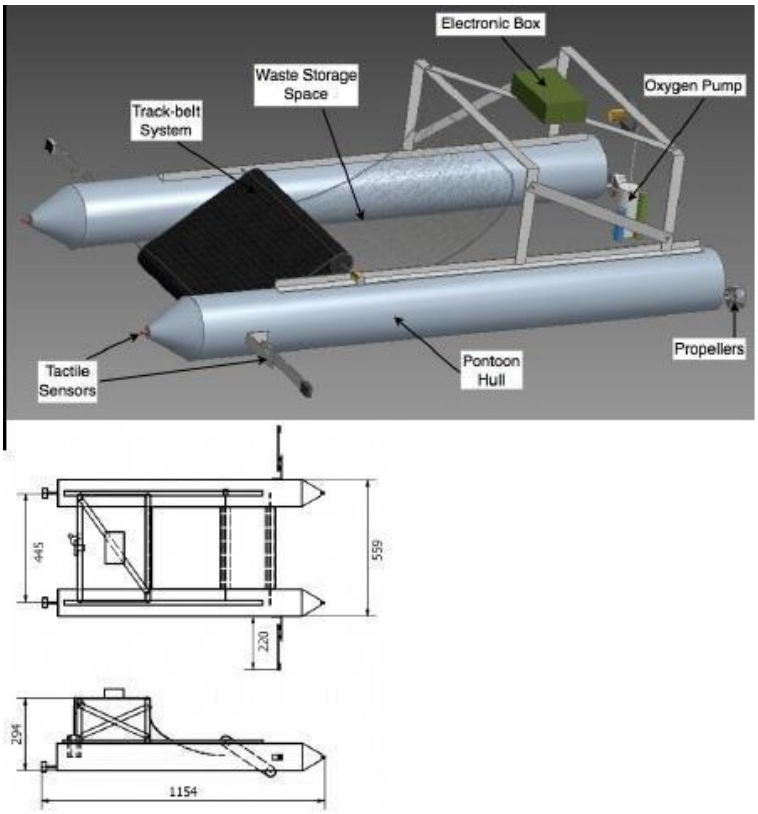


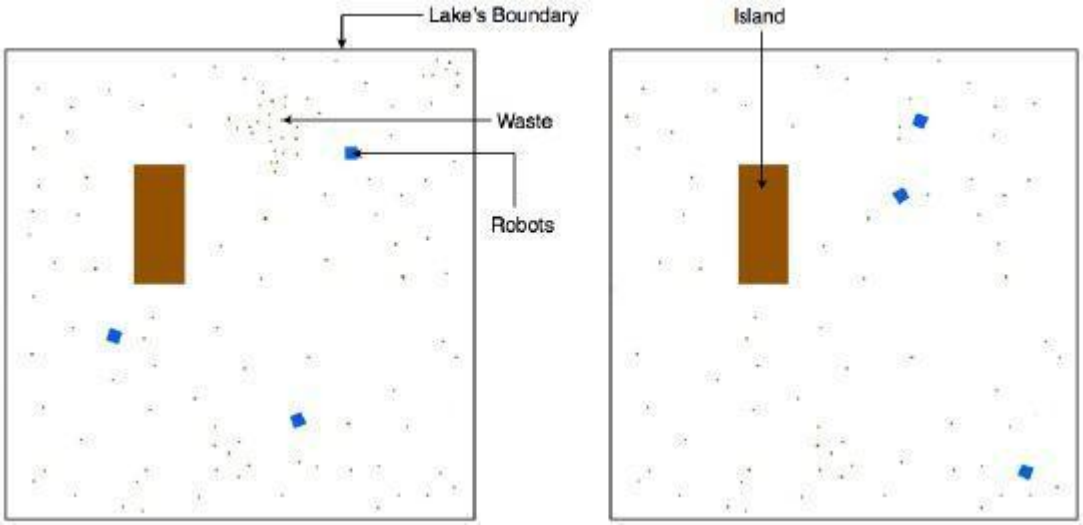
Fig. 1.1 primary design of the proposed floating structure

IV. NAVIGATION ALGORITHM

The navigation of the system is done by dividing the area around the system into quadrants. By using the radii if any other device of same purpose comes into the range of the current device then collision avoidance program will make the new device to move back in a straight line to avoid collision from the system. If the system detect any kind of obstacle in its range for more than a given or specified amount of time the cleansing algorithm will jump into act and it will move in a spiral motion to make sure the most amount of debris is collected en route to the obstacle.

Recruitment call – A recruitment call is when a bot detects that the waste in the area is more than can be handled by a single bot then it sends a recruitment call to the bots present nearby which are free. To make sure that a bot is free or busy a switch should be used in the algorithm so that when a busy bot receives the recruitment call it does not respond until it completes the work assigned to it.

The system is made aware of the density and distance of the waste from the bot this helps the system to decide to send the request or recruitment call to the most favorable bots so that energy doesn't have to be wasted by recruiting the bots far away when more efficient method is possible.



V. APPLICATION

The system described has a various high variety of applications. The major application of the system is to be used in water bodies which is available to the public without any restrictions as these have the high probability of contamination. This is inferred as these bodies are more exposed to human interference thus increasing the probability for the interaction thus resulting in being more prone to be contaminated. It can also be used in industries to make sure that the reservoirs stay cleaned. Currently most of the areas where large reservoirs are used it has been noticed that the base areas are usually layered with either accumulating of the waste. This can be avoided if the proposed system is

to be introduced to the environment from the beginning of the reservoir. It can also be used in the pools after the working hours are over so that the man power required in the amusement parks etc. can be reduced.

VI. CONCLUSION

From the above information of this system up to now, surely comes to know that it is highly reliable effective and economical at water bodies, reservoirs and any form of aquatic environment. As this method saves us a lot of amount of labor and man-power and also reduce the time consumed to treat the water making the system efficient enough to be implemented considering the cost is negligible considering the application and need of the system. We know that though it is very beneficial but it is also impossible to install such system at each and every place, but it gives certainly a considerable benefit to us, thereby to our nation.

REFERENCES

[1] PRANAY AGRAWAL AND BISHAKH BHATTACHARYA "AQUATIC MULTI-ROBOT SYSTEM FOR LAKE CLEANING"

[2] Department of Ecology, Limnology, University of Lund, Ecology Building, S – 223 62 Lund, Sweden URL: http://www.aseanbiodiversity.info/Abstract/5100 6316.pdf

[3] Zhongli Wang, Yunhui Liu, Hoi Wut Yip, Biao Peng, Shuyuan Qiao, and Shi He "Designand Hydrodynamic Modeling of A Lake Surface Cleaning Robot" AIM 2008.

[4] M. A. Abkowitz, "Measurement of hydrodynamic characteristics from ship manoeuvering trials by system identification,"SNAME Trans. 88 (1980).

[5] NMP Kakalis, and Y Ventikos "Robotic swarm concept for efficient oil spill confrontation"Journal of hazardous materials, 2008

[6] M.A. Joordens "Design of a low cost underwater robotic research platform" System of Systems Engineering, 2008

[7] Altshuler, Y. Bruckstein, A.M. and Wagner, I.A. "Swarm robotics for a dynamic cleaning problem"Swarm Intelligence Symposium, 2005

[8] Ke Cheng and P Omaha Dasgupta "Dynamic Area Coverage using Faulty Multi-Agent Swarms" Intelligent AgentTechnology, 2007

[9] Massimo Caccia, Marco Bibuli, Riccardo Bonoa and Gabriele Bruzzone "Basic navigation, guidanceand control of an Unmanned Surface Vehicle" Autonomous RobotsNovember 2008, Volume 25, Issue 4, pp 349-365

[10] E.K. Boulougouris, A.D. Papanikolaou, Y. Le Corre, F. Ghozlan, O. Turan, N.M.P. Kakalis, Y. Ventikos, D. Fritsch, V. Campos, "Efficient oil spill confrontation by innovative EU-MOP unit" Proceedings of the Inter- national Symposium on Maritime Safety, Security and Environmental Protection, Athens, Greece, 2007

[11] Gerald P. Cooper & George N. Washburn "Relation of Dissolved Oxygen to Winter Mortality of Fish in Michigan Lakes" Transactions of the American Fisheries Society Volume 76, Issue 1.

[12] R Menzel, K Geiger, L Chittka, J Joerges, J Kunze and U M&Uuml "The knowledge base of bee navigation" J. Exp. Biol.199, 141-146 (1996).

[13] Gazi, D. Andina, and M. Jamshidi"Building a swarm of robotic bees"World Automation Congress, 2010

[14] Ministry of Water Resources, Government of India URL: http://www.worldlakes.org/uploads/Management _of_lakes_in_India_10Mar04.pdf

[15] https://www.academia.edu/17395749/AQUATIC_MULTI-ROBOT_SYSTEM_FOR_LAKE_CLEANING